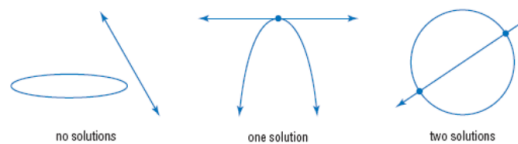


8-7 Solving Quadratic Systems

Line and quadratic

Quadratic and quadratic

SYSTEMS OF QUADRATIC EQUATIONS If the graphs of a system of equations are a conic section and a line, the system may have zero, one, or two solutions. Some of the possible situations are shown below.



If the graphs of a system of equations are two conic sections, the system may have zero, one, two, three, or four solutions. Some of the possible situations are shown below.



Solve.

$$4x^2 + y^2 = 25$$

$$2x + y = -1$$

ellipse
line

$$y = -1 - 2x$$

$$4x^2 + (-1 - 2x)^2 = 25$$

$$4x^2 + 1 + 4x + 4x^2 = 25$$

$$8x^2 + 4x - 24 = 0$$

$$2x^2 + x - 6 = 0$$

$$(2x - 3)(x + 2) = 0$$

$$x = \frac{3}{2} \quad x = -2$$

$$\left(\frac{3}{2}, -4 \right) \\ (-2, 3)$$

Solve.

$$x^2 - 3y^2 = 8$$

$$x - y = 2$$

hyp
line

$$x = y + 2$$

$$(y+2)^2 - 3y^2 = 8$$

$$y^2 + 4y + 4 - 3y^2 = 8$$

$$-2y^2 + 4y - 4 = 0$$

$$y^2 - 2y + 2 = 0$$

No Real Sol'n

Solve.

$$x^2 + 2y^2 = 23$$

$$(2x^2 - y^2 = 1)$$

$$4x^2 - 2y^2 = 2$$

$$5x^2 = 25$$

$$x^2 = 5$$

$$x = \pm\sqrt{5}$$

$$\begin{pmatrix} +\sqrt{5}, \pm 3 \end{pmatrix}$$

$$\begin{pmatrix} -\sqrt{5}, \pm 3 \end{pmatrix}$$

Solving systems of Inequalities.

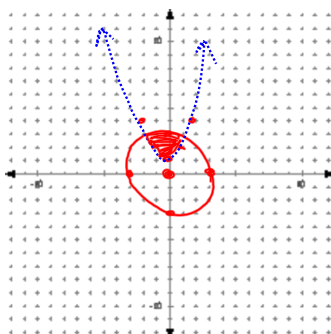
$$x^2 + y^2 \leq 9$$

$$y > x^2 + 1$$

$$C(0,0) \quad r=3$$

$$V(0,1)$$

$$\begin{matrix} 1, 2 & 2, 5 \\ -1, 2 & -2, 5 \end{matrix}$$



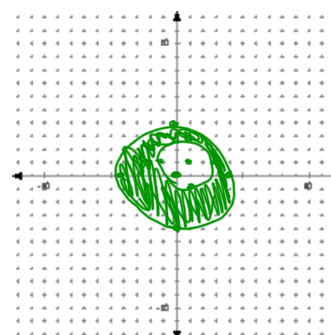
Solve.

$$x^2 + y^2 \leq 16$$

$$(x-1)^2 + (y-1)^2 \geq 4$$

$$C(1,1)$$

$$r=2$$



HW

p458-459

17, 19, 21, 24, 28, 32-34


line up